Cupaniopsis cooperorum (Sapindaceae), a new species from the Wet Tropics, Queensland

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Summary

Forster, P.I. (2002). *Cupaniopsis cooperorum* (Sapindaceae), a new species from the Wet Tropics, Queensland. *Austrobaileya* 6 (2): 267–271. A new species from the Wet Tropics rainforest, *Cupaniopsis cooperorum* is described and illustrated. This species is restricted to complex notophyll vineforest on basalt derived substrates in the area around Topaz, Millaa Millaa and Butchers Creek. A conservation status of Vulnerable is recommended. A new key to the species of Australian *Cupaniopsis* is provided.

Keywords: *Cupaniopsis* – Australia; *Cupaniopsis cooperorum.*

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Introduction

The genus *Cupaniopsis* Radlk. comprises at least 60 species and is distributed in Malesia (New Guinea, Celebes, Moluccas), various islands in the Western Pacific and Australia (Adema 1991). Fourteen described species have been recognised for Australia (Reynolds 1985, 1991, 1997), although Adema (1991) only recognised twelve more broadly defined ones in his monograph. It is probable that additional species of *Cupaniopsis* exist in Australia (Reynolds 1997; Forster & Jessup 2002); however as yet, insufficient material is available for their description.

The subject of this paper, was brought to my attention in 1994 by Wendy Cooper of Topaz who had first collected specimens in January 1992. This and subsequent Cooper collections (*WWC* 106, 486, 487, 617, 627, 659, 849, 882, 970, 1065) have all been deposited in QRS. They were tentatively identified by B.Hyland of QRS as belonging to *Lepiderema.* In local colloquial usage in the 'Wet Tropics' of north-eastern Queensland, the plant was often referred to as 'Cooper's Puzzle'. Subsequent collections of flowering and fruiting specimens for BRI have enabled a critical examination of its characters, revealing that it actually represents an undescribed species of *Cupaniopsis.* Reynolds (1985) considered that the genus *Cupaniopsis* was distinguished by "the insides of the subglobose or obovoid capsules being villous, the cupular aril nearly enclosing the seed and sepals being usually silky outside". Adema (1991) considered *Cupaniopsis* as being primitive within Sapindaceae and that typical characters included the "dimorph sepals, the usually not crested petalar scales and the complete, often hairy disc; a pseudo-funicle is absent". This new species has the first and second characters of Reynolds, but not the third. The character of the sepals being silky outside is not diagnostic for the genus *Cupaniopsis* as nearly half the Australian species do not possess it (Reynolds 1985, 1991). The new species has 2-seriate sepals, non-crested scales on the petals, a complete and glabrous disc, and no funicle on the seed, thus fulfilling the generic requirements of *Cupaniopsis.*

Accepted for publication 4 July 2002

Taxonomy

Cupaniopsis cooperorum P.I.Forst., **sp. nov.** Proprius inter species Australianas foliis glabrus. Affinis *Cupaniopsis foveolatae* surculis glabris (strigosis comparate), foliis 3–5-jugatis ((5–) 6–8 (–12)-jugatis comparate), foliolis oblanceolatis vel raro ellipticis (angusto-ovatis usque angusto-ellipticis comparate), integris (crenatis comparate), domatiis absentibus, petalis late obovatis (ellipticis usque orbicularibus comparate) majoribus 2.8–3 × c. 0.5 mm (1–1.7 × 0.7–1.6 mm comparate),

seminibus nigris, 13–14 x 9–10 mm majoribus (8–8.5 × 6.5–7 mm comparate) differt. **Typus:** Queensland. Cook District: Wooroonooran National Park, end of Westcott Road, Topaz, 2 November 1999, *P.I.Forster* PIF25156, *R.Booth & W.Cooper* (holo: BRI [1 sheet + spirit]; iso: A, K, L, MEL distribuendi).

Lepiderema sp. (Topaz P.I.Forster+ PIF15478), Forster & Jessup (2002: 184).

Small tree to 7 m high, monoecious, often multistemmed; bark nondescript; blaze thin, yellow to straw; wood dense, straw. Branchlets ± smooth, brown-grey, glabrous; flowering twigs 2–4 mm thick. Leaves 3–5-jugate, often with a subterminal leaflet; petiole 52–70 mm long, terete, glabrous; rhachis 160–190 mm long, glabrous. Leaflets subopposite to strongly alternate, pergamentaceous, oblanceolate, rarely elliptic, 47–170 mm long, 15–55 mm wide, length-width index 2.5–3.8, glabrous, domatia absent; base oblique to cuneate; apex acute to shortly acuminate; margins flat, entire; both sides glabrous and glossy; venation of 10–13 pairs per side of the midrib, main lateral veins 3–12 mm apart, most venation looped and densely reticulate, on upper surface visible but with only the midrib slightly raised, on lower surface visible with both the midrib and main lateral veins raised; petiolules 5–17 mm long, slightly grooved, glabrous; pulvini 2–4 mm long, glabrous. Inflorescences axillary, not branching from base, 20–110 mm long, panicles, glabrous; bracts and bracteoles 0.5–0.8 mm long. Flowers 2.5–4 mm diameter, cream; pedicels 2–6 mm long, glabrous; sepals 2-seriate, weakly imbricate, ciliolate, externally glabrous, internally with short sparse indumentum in the lower half, outer ones broadly-elliptic, concave, 3–3.5 mm long, c. 2 mm wide, inner ones broadly ovate, 2.8–3 mm long, c. 2 mm wide; petals 5, broadly obovate, 2.8–3 mm long, c. 0.5 mm wide, externally with dense indumentum in lower half, apex margin irregularly lobed, scales present and densely pilose with antrorse indumentum; disc glabrous, c. 2.5 mm diameter. Stamens 8 (reduced to staminodes in female flowers), filaments 1–1.2 mm long, c. 0.3 mm wide, with dense indumentum along entire length, anthers c. 1 mm long and 0.5 mm wide, glabrous or with an occasional hair. Pistil: ovary 3-locular, 2.8–3 mm long, densely pilose, glabrescent; style and stigma c. 1.5 mm long, glabrous (reduced to pistillode in male flowers). Fruit with 2 or 3 well developed lobes, 15–20 mm high, 15–20 mm diameter, outside rugose to ribbed, glabrous, orange-pink, inside densely villous; stipe 2.5–3 mm long. Seeds ellipsoid-obovoid, 13–14 mm long, 9–10 mm wide, glossy black; hilum 0.5–1 mm wide, pseudohilum c. 3 mm wide; arillode orange, covering most of the seed. Fig. 1.

Additional specimens examined: Queensland. Cook District: Westcott Road, Topaz, Jul 1994, *Forster* PIF15478 & *Cooper* (BRI); ditto loc., Nov 1995, *Forster* PIF18185 *et al.* (BRI, MEL); Wooroonooran National Park, 3 km E of Butchers Creek, Nov 1998, *Forster* PIF23960 *et al.* (A, AD, BISH, BRI, K, L, MEL, NSW).

Distribution and habitat: *C. cooperorum* is quite restricted in its occurrence on the Atherton Tablelands in the Wet Tropics of Queensland, with populations observed from near Butchers Creek and Topaz to Zillie Falls near Millaa Millaa (W. Cooper pers. comm. Jan. 2002). Plants have been found in complex notophyll vineforest on red soils derived from basalt at altitudes between 600 and 900 m.

Notes: *C. cooperorum* is immediately recognisable amongst the Australian species of the genus by dint of its totally glabrous and glossy foliage with even young shoots lacking trichomes. For the purposes of diagnosis it is compared here to *C. foveolata* which is perhaps most similar in superficial appearances. *C. cooperorum* differs from *C. foveolata* in the young shoots being glabrous (versus strigose), the leaves 3–5-jugate (versus (5–) 6–8 (–12)-jugate) with oblanceolate or rarely elliptic leaflets (versus narrowly ovate to narrowly elliptic) that are entire (versus crenate), the absence of domatia, the petals broadly obovate (versus elliptic to orbicular) and larger (2.8–3 × c. 0.5 mm versus 1.0–1.7 × 0.7–1.6 mm) and the larger seeds (13–14 × 9–10 mm versus 8–8.5 × 6.5–7 mm) that are black (versus brown). A further superficial relationship may be possibly sought with *C. dallachyi* S.T.Reynolds, however that species is immediately recognisable by the leaves that are 6–7-jugate with much larger leaflets that

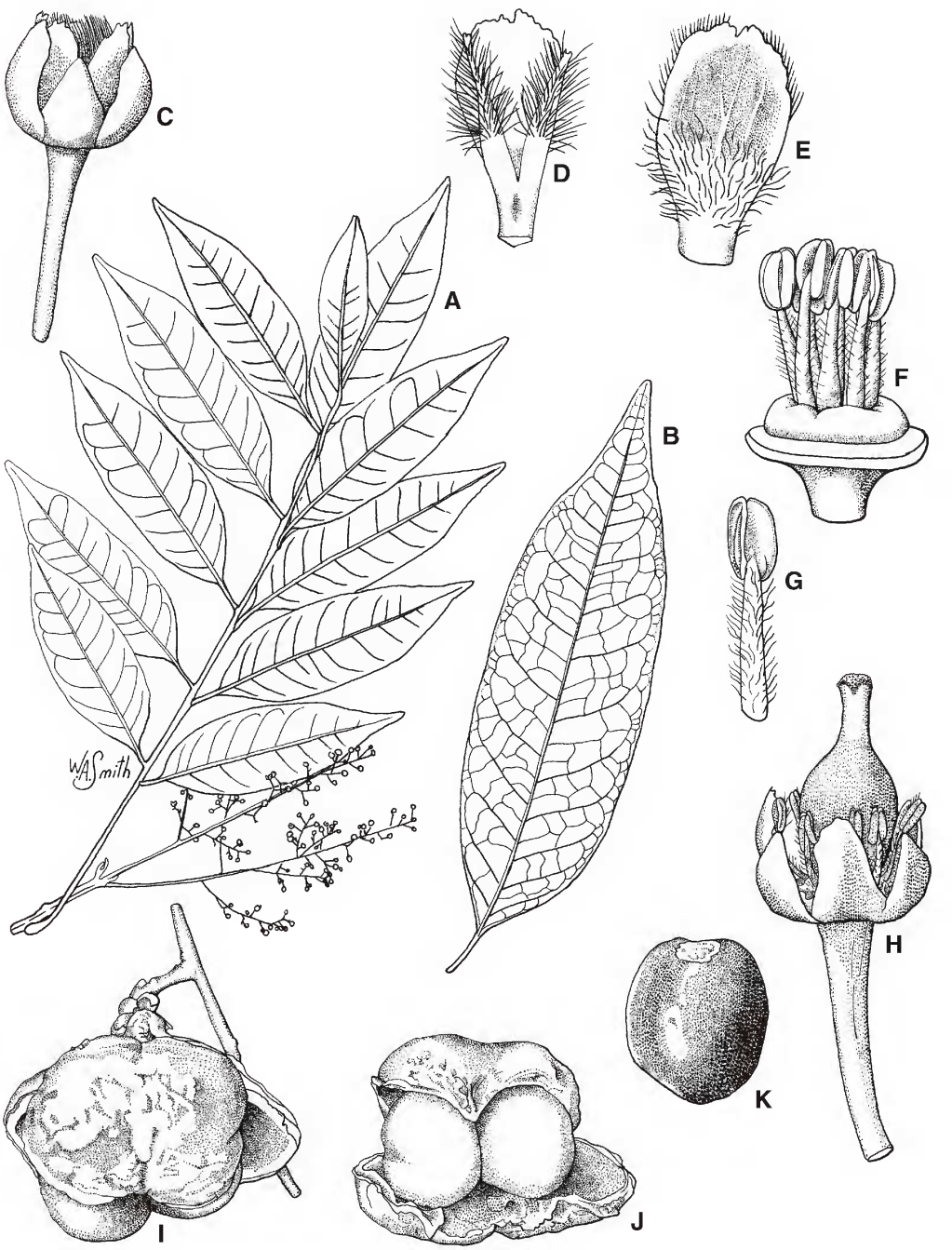

Fig. 1. ***Cupaniopsis cooperorum***. A. flowering twig with entire leaf. × 0.4; B. detail of venation in individual leaflet. × 0.8; C. side view of male flower, note outer sepals being longer than inner. × 6; D. internal view of petal showing two scales covered in indumentum and the irregular apex. × 12; E. external view of petal showing indumentum. × 12; F. side view of flower with perianth removed showing disk and stamens. × 9; G. stamen. ×12; H. side view of female flower, with staminodes. × 6; I. side view of dehiscing fruit. × 1.5; J. face view of dehiscing fruit with two seed in situ, both entirely covered by arillodes. × 1.5; K. face view of seed with hilum at top. × 2; A–H from *Forster* PIF25156 *et al.* (BRI); J–L from *Forster* PIF23960 *et al.* (BRI). Del. W.Smith.

are narrow-ovate and coriaceous. The flowers of *C. cooperorum* also appear to be unique in the genus in that the outer sepals are noticeably longer than the inner (Fig. 1C), which is the opposite of the other species in the genus (Adema 1991).

Although Adema (1991) presented a number of phylogenetic analyses based on morphological characters, he was unsatisfied with most of them and I feel it would be premature to attempt to relate this species to others in the genus in the absence of molecular data.

A new key is presented here to the Australian species of *Cupaniopsis* based in part on that published by Adema (1991), but including *C. parvifolia* (F.M.Bailey) L.A.S.Johnson and *C. simulatus* S.T.Reynolds as are currently recognised by the Queensland Herbarium. Collectors should ensure that they procure young shoot tips to accurately determine the character of stem apex indumentum.

Key to the Australian species of *Cupaniopsis*

1. Leaflets mainly cuneate, widest at or near apex 2
   Leaflets elliptic, ovate, obovate or oblanceolate, widest well below apex 3

2. Leaves 2–8(–10)-jugate, with pseudostipules. Leaflets spinose-dentate ..... **C. shirleyana** (F.M.Bailey) Domin
   Leaves 1–2(–3)-jugate, without pseudostipules. Leaflets apically with 2–4 obtuse teeth, rarely entire ..... **C. wadsworthii** (F.Muell.) Radlk.

3. Young stem-apices glabrous ..... **C. cooperorum** P.I.Forst.
   Young stem-apices pubescent 4

4. Young stem-apices villous or tomentose (noticeably hairy) 5
   Young stem-apices strigose (finely puberulent) 9

5. Sepals internally glabrous. Fruits 15–20 mm long, 22–28 mm wide, internally glabrous ..... **C. tomentella** (F.Muell. ex Benth.) S.T.Reynolds
   Sepals internally with appressed hairs, rarely glabrous. Fruits 9–20 mm long,13–18 mm wide, internally villous 6

6. Margin of leaflets entire. Fruit pericarp 2.4 mm thick or more ... **C. diploglottoides** Adema
   Margin of leaflets ± dentate to crenate. Fruit pericarp 0.5–1.8 mm thick 7

7. Teeth of leaflets hard. Inflorescences 1.5–6.5 cm long. Disc glabrous ..... **C. serrata** (F.Muell.) Radlk.
   Teeth of leaflets soft. Inflorescences (6.5–) 11–60 cm long. Disc with hairs in five tufts ... 8

8. Petiole 3.5–9 cm long; leaves 4–10-jugate. Anthers hairy ..... **C. flagelliformis** (F.M.Bailey) Radlk.
   Petiole 8–16 cm long; leaves (8–) 10–12-jugate. Anthers glabrous ..... **C. newmanii** S.T.Reynolds

9. Leaflets crenate-dentate 10
   Leaflets entire 11

10. Trees over 10 m high. Leaflets with dome-shaped to pocket-like domatia. Fruits 18–22 x 18–20 mm; seeds 17–18 mm long, c. 9 mm wide ..... **C. baileyana** Radlk.
    Shrubs or small trees to 12 m high. Leaflets with pustulate domatia. Fruits c. 15 x 13–15 mm; seeds 8–10 mm long, 6.5–7 mm wide .. **C. foveolata** (F.Muell.) Radlk.

11. Leaflets with domatia. Disc glabrous or short hairy all over 12
    Leaflets without domatia. Disc with hairs in 5 tufts 13

12.Leaves (2–) 4–6-jugate. Leaflets obovate, rarely elliptic. Inflorescences 4–20cm long ..... **C. fleckeri** S.T.Reynolds
Leaves 6–7-jugate. Leaflets ovate to narrow-ovate. Inflorescences 17–25 cm long ..... **C. dallachyi** S.T.Reynolds

13.Lateral nerve pairs in leaflets 2–5 mm apart ..... **C. parvifolia** (F.M.Bailey) L.A.S.Johnson
Lateral nerve pairs in leaflets 6–20 mm apart 14

14.Small spreading tree to 15 m tall. Leaflet upper surface vernicose; reticulate venation fine. Fruits glabrous ..... **C. anacardioides** (A.Rich.) Radlk.
Tall straight trees to 25 m tall. Leaflet upper surface slightly shiny; reticulate venation coarse. Fruits puberulent ..... **C. simulatus** S.T.Reynolds

Conservation status: *C. cooperorum* is present in Wooroonooran National Park at Topaz and east of Butchers Creek. It can be quite locally common in some rainforest remnants in the area, e.g. Westcott Road. It has a quite restricted area of distribution (less than 100 km^2) and is known from only three populations. It fulfils the criteria of Vulnerable under the IUCN (2001) categories of B1, C2a, D2.

Etymology: This species is named for both Wendy and William (Bill) T. Cooper of Topaz, author and artist respectively of the book 'Fruits of the Rain Forest' published in 1994. The Coopers are currently working on a much expanded version of this book with many additional paintings and an expanded text.

Acknowledgements

I thank Wendy Cooper for bringing this species to attention and for providing information on specimens deposited in QRS. Ron Booth (BRI), Wendy Cooper and Rigel Jensen for assistance in the field on some occasions when this plant was collected. Will Smith (BRI) for the illustrations. Peter Bostock (BRI) for comments on the manuscript. Les Pedley for translation of the diagnosis into Latin.

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